

BORODIN, O.I.

[Theory of numbers] Teoriia chisel; dopushcheno iak pidruchnyk
dlia studentiv fizyko-matem. fakul'tetiv pedagogichnykh instytutiv
URSR. Kyiv, Radians'ka shkola, 1960. 243 p. (MIRA 14:11)
(Numbers, Theory of)

BORODIN, P.A.; GERASIMENKO, M.A.; PAVLENKO, P.S.; ALEKSEYEV, V.N.

Miners are fighting for the fulfillment of the seven-year plan ahead of time. Ugol' 39 no.11:11-17 N '64.

(MIRA 18:2)

1. Glavnyy inzh. Lisichanskogo tresta ugol'noy promyshlennosti Ministerstva ugol'noy promyshlennosti SSSR (for Borodin).
2. Shakhta No.13 tresta Kiselevskugol' (for Gerasimenko, Pavlenko, Alekseyev).

BORODIN, P.A., gornyy inzh.; MOISEYEV, M.A., kand.tekhn.nauk

Selecting an efficient place for lateral drifting. Ugol' 40
no.9:16-18 S '65. (MIRA 18:10)

1. Test Idisichanskugol' Donetskogo soveta narodnogo khozyaystva.

BORODIN, P.D.

Development of the technical and economic foundation of communism
and the objectives of the machinery industry. Vest.mash. 41 no.11:
7-10 N '61. (MIRA 14:11)

1. Zamestitel' predsedatelya Gosudarstvennogo komiteta Soveta
Ministrov SSSR po avtomatizatsii i mashinostroyeniyu.
(Russia--Economic policy)
(Machinery industry)

BORODIN, P.D.

Organizing experimental and model enterprises. Mekh.i
avtom.proizv. 16 no.11:3-5 N '62. (MIRA 15:12)

1. Zamestitel' predsedatelya Gosudarstvennogo komiteta
Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu.
(Industrial management)
(Automation)

BORODIN, P.D.

Most urgent objective is to increase the efficiency of the machinery industry. Vest.mashinostr. 43 no.4:3-8 Ap '63. (MIRA 16:4)

1. Zamestitel' predsedatelya Gosudarstvennogo komiteta po avtomatizatsii i mashinostroyeniyu pri Gosplane SSSR.
(Machinery industry)

SKAFPOV, Fedor Ivanovich; OSTROUMOV, G.A., prof., red.; RASKIN,
Sh.Sh., st. nauchn. sotr., red.; SHUTILOV, V.A., dots.,
red.; BORODIN, P.M., red.

[A course of lectures on microwave spectroscopy] Kurs
lektzii po radiospektroskopii. Leningrad, Izd-vo Leningr.
univ., 1964. 211 p. (MIRA 18:2)

BORODIN, P. M.

"Investigation of chemical mixtures and the fine structure of signals of the nuclear magnetic resonance of fluorine in a series of its compounds." Leningrad Order of Lenin State U imeni A. A. Zhdanov. Leningrad, 1956. (Dissertations for the Degree of Candidate in Physicomatheratical Sciences)

SO: Knizhnaya letopis', No. 16, 1956

31. P. M. BORODIN, F. I. SKRIPOV: Certain applications of the method of nuclear magnetic resonance at radio frequencies (Leningrad Univ.) *pp. 2*

A method of measuring the magnetic field (with an error less than 1%), and of investigating the field configuration in the magnet can are described. A magnetic field homogeneity of the order of 10^{-4} is obtained in the volume of the sample for a field level of 6500 G. Brief results are given of investigations of the position of nuclear magnetic resonance of fluorine independently of the molecular structure. The substance and possible applications of this new radio spectroscopy method to practical questions of chemical technology are discussed.

RADISTEKHNIKA I ELEKTRONIKA, Vol 1, Nr 6, 1956, p 632

PRIKHOT'KO, A.F.

24(7) p 3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizichnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jaser, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsterg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Pabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Pabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

Card 1/30

Aleksanyan, V.T., Kh. Ye. Sterin, M. Yu. Lukina, et al. Raman Spectra of Certain Cyclopropane Hydrocarbons and the Double-bond Conjugation of a Three-membered Ring

64

Aleksanyan, V.T., Kh. Ye. Sterin, M. Yu. Lukina, and L.A. Nakhapetyan. Raman Spectra of Certain Monoalkyl Cyclobutanes and of Cyclobutylbromide

68

Klochkov, V.P. Effect of the Solvent on Absorption and Fluorescence Spectra

71

Barchukov, A.I., T.M. Mirina, and A.M. Frokhorov. Microwave Spectrum of the C_2H_5Cl Molecule

75

Scripov, P.I. Temperature Dependence of the Frequencies of the Nuclear Quadrupole Resonance

75

Borodin, E.M., P.I. Scripov. Chemical Displacement and the Fine Structure of the Nuclear Magnetic Resonance of Fluorine in a Series of Compounds

77

06491

SOV/141-58-4-7/26

AUTHORS: Borodin, P.M. and Skripov, F.I.

TITLE: Chemical Shifts and Fine Structure of F^{19} Nuclear
Magnetic Resonance Signals. II. Organic Fluorine Compounds
(Khimicheskiye smeshcheniya i tonkaya struktura
signalov yadernogo magnitnogo rezonansa F^{19} . II.
Organicheskiye ftorsoderzhashchiye soyedineniya)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika,
1958, Nr 4, pp 69-80 (USSR)

ABSTRACT: The present paper summarizes the work on nuclear
resonance spectra of fluorine in its various organic
compounds. This work was carried out by the authors
mainly in 1955-6. A short general review and the
experimental technique were given in Part I of this
series (Ref 5). Some of the results have already been
reported by the authors at the First Conference on
Radio-Electronics convened by the Ministry of Higher
Education of the USSR (Gor'kiy, July 1956) and at
the Tenth All-Union Conference on Spectroscopy (L'vov,
July 1956). The present paper deals with nuclear
magnetic resonance (n.m.r.) of F^{19} in molecules in

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Chemical Shifts and Fine Structure of F^{19} Nuclear Magnetic
Resonance Signals.II. Organic Fluorine Compounds

which fluorine is attached to an aliphatic atom of a hydrocarbon. The majority of the compounds studied were prepared at the Nr 6 Laboratory of the State Institute for Applied Chemistry and the authors thank the workers of this laboratory, and especially A.G.Oshuyev, for their help. The authors studied 25 compounds whose chemical composition and molecular structure were known. The results are shown graphically in Fig 1 where the abscissa represents the quantity $\delta \times 10^5$ (for definitions see Ref 5) and the ordinate is proportional to the relative intensities of lines. The authors measured also chemical shifts of F^{19} n.m.r. signals (Fig 2) in compounds with unknown or not exactly known molecular structure (Nr 26-36 in Fig 2) and in two series of liquid fluorinated polymers (Nr 37-51 in Fig 2). A total of 51 compounds was studied (about 150 n.m.r. lines). For compounds with known molecular structure the spectra were interpreted and various lines were assigned to different fluorine-containing groups. Certain empirical

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Chemical Shifts and Fine Structure of F^{19} Nuclear Magnetic
Resonance Signals. II. Organic Fluorine Compounds

regularities were found which relate the magnitude of magnetic screening of F^{19} nuclei with the nature of chemical environment of the fluorine atoms in various molecules. It was found that interactions were effective in the range of one or even two intermediate carbon atoms. The results obtained were used to derive data on the chemical and structural properties of aliphatic fluorine compounds with unknown or doubtful molecular structure (compounds 37-51 of Fig 2). The authors discussed in particular determination of the structural formula of a molecule when the latter's chemical composition and n.m.r. spectrum were known. There are 2 figures, 1 table and 10 references, 5 of which are Soviet and 5 English.

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06491

SOV/141-58-4-7/26

Chemical Shifts and Fine Structure of F^{19} Nuclear Magnetic
Resonance Signals. II. Organic Fluorine Compounds

ASSOCIATION: Issledovatel'skiy Fizicheskiy institut pri
Leningradskom universitete (Physical Research Institute,
Leningrad University)

SUBMITTED: 26th November 1957

Card 4/4

BORODIN, P.M.; SKRIPOV, F.I.

Chemical displacements and fine structure of signals in nuclear magnetic resonance of F^{19} Part 1: Experimental procedure and investigation of the HF -- H_2O system. Izv.vys.ucheb.zav.; radiofiz. 1 no.3:37-49 '58. (MIRA 12:1)

1. Issledovatel'skiy fizicheskiy institut pri Leningradskom universitete.
(Nuclear magnetic resonance) (Hydrofluoric acid)

ALEKSANDROV, N. M., BORODIN, P. M., MOSKALEV, V. V., SKRIPOV, F. I. (LGU, Leningrad)

"The Development of Equipment for Investigating Molecular and Crystal Structures by Nuclear Magnetic Resonance".

report presented at the All-Union Conference on Statistical Radio Physics, Gor'kiy, 13-18 October 1958. (Izv. vyssh uchev zaved-Radiotekh., vol. 2, No. 1, pp 121-127) COMPLETE card under SIFOROV, V. I.)

BORODIN, P.M.; LEGIN, Ye.K.; SVENTITSKIY, Ye.N.; KHUSIDMAN, M.B.;
SHCHERBAKOV, V.A.

Action of heavy water on the chemical shift of F^{19} . Zhur.strukt.khim.
4 no.2:266-267 Mr-Ap '63. (MIRA 16:5)

1. Fizicheskiy institut Leningradskogo gosudarstvennogo universiteta.
(Deuterium oxide) (Fluorine isotopes)
(Nuclear magnetic resonance and relaxation)

L 11403-63

EW(1)/BDS AFFIC/ASD

S/032/63/029/005/017/022

52

AUTHORS: Borodin, P. M. and Sventitskiy, Ye. N.

TITLE: Nuclear magnetic resonance²¹ apparatus of average resolution

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 5, 1963, 611-613

TEXT: A description is given of the design and operating principles of several NMR spectrographs with average resolution (10^{-4} to 10^{-5}), suitable for such purposes as measurement of relaxation time, study of the internal motion of a substance, quantitative analysis and studies of crystals. The units are assemblies of previously-described elements. There are four figures and no tables. The most important English-language references are as follows: H. S. Gutowsky, L. H. Meyer and P. E. McClure, Rev. Sci. Instrum., 24, 644 (1953); H. L. Anderson, Phys. Rev., 76, 1460 (1949); J. T. Arnold, Phys. Rev., 102, 136 (1956) and J. E. Goley, Rev. Sci. Instrum., 29, 313 (1958).

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Scientific Research Physics Institute of Leningrad State University imeni A. A. Zhdanov)

Card 1/1

ja/1/

ACCESSION NR: AP4024464

S/0054/64/000/001/0157/0159

AUTHOR: Borodin, P. M.

TITLE: Phase method of terrestrial magnetic field measurement using nuclear-resonance filter

SOURCE: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1964, 157-159

TOPIC TAGS: nuclear-resonance filter, terrestrial magnetic field, phasing coil, Lissajous figure

ABSTRACT: The F. I. Skripov (DAN AN SSSR, 121,998, 1958) generator has been used as a nuclear-resonance filter for terrestrial magnetic field measurements with a broken reverse coupling, the input of which consists of a phasing coil and the output--a receiver coil. The phase shift obtained from measuring the terrestrial field H_0 is displayed as Lissajous figures on an oscilloscope. The sensitivity of this device is shown to be 0.1 to 0.3 gamma, and an undistorted signal registered from magnetic perturbations of $T \geq 2$ second is ensured. This is shown to

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ACCESSION NR: AP4024464

allow simultaneous measurement of short-period field variations as well as slow changes. "The author is grateful to A. V. Mel'nikov and A. A. Morozov." Orig. art. has: 3 figures and 1 equation.

ASSOCIATION: none

SUBMITTED: 00Nov63

SUB CODE: PH

DATE ACQ: 16Apr64

NO REF SOV: 002

ENCL: 00

OTHER: 001

Card 2/2

L 12855-65 EWT(1)/FCC/BEC(t) Po-4/Pi-4 RAEM(c)/ESD(t) GW
ACCESSION NR: AR4047581 S/0169/64/000/009/A008/A008

SOURCE: Ref. zh. Geofizika, Abs. 9A30

AUTHOR: Borodin, P. M.

TITLE: Phase method for measurement of the earth's magnetic field using a nuclear-resonance filter

CITED SOURCE: Vestn. Leningr. un-ta, no. 4, 1964, 157-159

TOPIC TAGS: nuclear resonance filter, magnetic field, magnetic pulsation, geomagnetic field, magnetic disturbance

TRANSLATION: Considerable difficulties arise when measuring short-period pulsations of the earth's magnetic field. These are due to the need for a careful analysis of oscillograms and the need for a lengthy period of measurements. The author proposes a phase method of measurements which is free of these shortcomings and ensures both the continuous measurement of short-period pulsations of the total vector of geomagnetic field strength and the recording of its slow variations. The method is based on the measurement of the phase difference between the signal of a nuclear-resonance filter (any device having nuclear-

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L 12855-65

ACCESSION NR: AR4047581

resonance characteristics will serve the purpose) and the voltage of a reference quartz oscillator whose frequency coincides with the frequency of the nuclear-resonance filter. An experimental check of the method, using a nuclear-resonance oscillator with a sample of a continuously flowing fluid (Skripov oscillator), revealed that the sensitivity of the instrument is 0.1-0.3 γ . Undistorted recording of signals is ensured when the duration of magnetic disturbances is of the order of ≈ 2 sec. U. Fastovskiy.

ASSOCIATION: None

SUB CODE: ES

ENCL: 00

Card 2/2

BORODIN, P.M.

Use of the free precession of nuclei in the earth's magnetic field in measuring the rate of flow of certain fluids. Zhur. tekhn. fiz. 34 no.7:1328-1336 J1 '64 (MIRA 17:8)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

BORODIN, P.M.; NIKITIN, M.K.; SVENITSKIY, Ye.N.

Structure of electrolytes in the ion-exchange resin phase studied
by the nuclear magnetic resonance method. Zhur. strukt. khim. 6
no.2:188-191 Mr-Apr '65. (MIRA 18:7)

1. Leningradskiy gosudarstvennyy universitet imeni Zhdanova.

L 17403-66 EWT(1)/EWT(m)/EWP(e) IJP(c) GS/WH

ACC NR: AT6004610 SOURCE CODE: UR/0000/65/000/000/0114/0122

AUTHOR: Borodin, P.M.; Sventitskiy, Ye. N.

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: A high-resolution nuclear magnetic resonance spectrograph

SOURCE: Leningrad. Universitat. Yadernyy magnitnyy rezonans (Nuclear magnetic resonance), no. 1, 1965, 114-122

TOPIC TAGS: NMR spectroscopy, nuclear magnetic resonance, spectroscope

ABSTRACT: In view of the special importance of structural NMR studies which require sensitive high-resolution spectrographs, the Laboratory of Radiospectroscopy, Physics Faculty, LGU (Laboratoriya radispektroskopii fizicheskogo fakul'teta LGU) built an NMR spectrograph capable of registering high-resolution spectra of hydrogen, fluorine, and phosphorus. The core of the permanent magnet has an annular shape; the cross section and material of the core were chosen in such a way as to avoid the iron saturation effects during magnetization. The magnet consists of 18 core blocks made of polished ANKo-4, 50 mm thick and 230 mm in diameter. The paper also describes Andersen compensators, various orthogonal current compensators, a block diagram of the electronic equipment,

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ACC NR: AT6004610

a Rollin preamplifier circuit, an HF quartz generator, and radio-frequency heads. The resolution is in general equal to $5 \cdot 10^{-7}$ and electrical compensators can improve it up to $8 \cdot 10^{-8}$. Further spinning of the sample increased the resolution finally to $2 \cdot 10^{-8}$ (for a convenient sample size of 0.1 cm^3). The sensitivity of the instrument is at least 10^{30} nuclei per sample. Orig. art. has: 8 figures. [08]

SUB CODE: 09/18 SUBM DATE: 03Nov65 / ORIG REF: 001 / OTH REF: 002 / ATD PRESS:

4206

Card 2/2

L 21195-66 EWT(m)/ETC(f)/ENG(m)/EWP(j)/T/EWP(t) IJP(c) DS/JD/WW/JW/GS/RM
ACC NR: AT6004607

SOURCE CODE: UR/0000/65/000/000/0083/0089

AUTHOR: Borodin, P. M.; Nikitin, M. K.; Sventitskiy, Ye. N.

ORG: none

TITLE: Use of the nuclear magnetic resonance method for studying the structure of
an electrolyte in ion exchange resins 1

SOURCE: Leningrad. Universitet. Yadernyy magnitnyy rezonans (Nuclear magnetic resonance). no. 1, 1965, 83-89

TOPIC TAGS: ion exchange resin, nuclear magnetic resonance, electrolyte, NMR spectroscopy, hydrofluoric acid

ABSTRACT: The authors studied AV-17 anion and KU-2 cation exchange resins saturated with hydrofluoric¹⁹(HF) and trifluoroacetic (CF₃COOH) acids of various concentrations. Measurements of chemical displacements in F¹⁹ signals were used as a basis for studying the properties of the ion exchange resins and also the structure of the electrolyte absorbed by the resins. Curves are given showing the chemical displacements in the resonance signal as a function of HF concentration in cation, anion and copolymer resins. These curves are compared with that for the chemical dis-

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ACC NR: AT6004607

placement of H^{19} in HF as a function of concentration in the free state. The curve for the cation behaves identically to that for the free acid which indicates a small, although noticeable, interaction between the electrolyte and the lattice of the resin. The coincidence between the curves for the free acid and the electrolyte absorbed by the copolymer indicates that the lattice of the copolymer has less effect on the state of the electrolyte than that of the ion exchange resins. Experiments with trifluoroacetic acid showed a single narrow resonance line for acid absorbed by the resin although the fluorine may exist in various states: as the CF_3COO^- ion, the CF_3COOH molecule, the CF_3COO^- gegenion and also in molecular associations. The curve for chemical displacement as a function of acid concentration for the cation exchange resin lies above that for the anion exchange resin. The curve for the copolymer lies above all the others, especially in the region of weak acid solutions. The experimental data indicate considerable interaction between the electrolyte and ion exchange resins. If the electrolyte is hydrofluoric or trifluoroacetic acid, the fluorine is absorbed by the cation exchange resin. Both ion exchange and non-ion exchange absorption takes place in the case of anion exchange resins. The single narrow line for an electrolyte absorbed by a resin indicates intense exchange of fluorine nuclei between various nonequivalent states. Orig. art. has: 3 figures.

SUB CODE: 07,20,11/

SUBM DATE: 03Nov65/

ORIG REF: 003/ OTH REF: 003

Card 2/2 dda

L 21827-66

ACC NR: AT6004614

(N)

SOURCE CODE: UR/0000/65/000/000/0144/0163

AUTHOR: Borodin, P. M.; Sventitskiy, Ye. N.; Chizhik, V. I.

ORG: none

TITLE: Investigation of toroidal units for measuring the flow velocity and discharge rate of a liquid on the basis of free precession of nuclei in the magnetic field of the earth qm

SOURCE: Leningrad. Universitet. Yadernyy magnitnyy rezonans (Nuclear magnetic resonance). no. 1, 1965, 144-163

TOPIC TAGS: flow measurement, flow meter, nuclear magnetic resonance, earth magnetic field

ABSTRACT: The authors consider the design of toroidal units for using free precession of nuclei in the magnetic field of the earth to measure the discharge rate of a liquid. Optimum dimensions are found for such a gauge with given rate of flow v , and relaxation times T_1 and T_2 . The Packard-Varian method (M. Packard, R. Varian, *Phys. rev.*, 93, 941, 1954) may be used for measuring the flow velocity and discharge rate of a liquid using free precession of nuclei in the magnetic field of the earth in the simplest case. This method gives discrete readings in time inter-

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ACC NR: AT6004614

vals of 1-4 seconds. When continuous measurement is necessary, two of these measurement systems may be used with opposed connection of the operating cycles ("magnetization-observation") or any nuclear resonance generator of the Skripov type (F. I. Skripov, *DAN SSSR*, 121, No 6, 998, 1958). The method described in this paper may be used for measuring the flow velocity of liquids which contain hydrogen, fluorine, and various other elements which give a strong nuclear magnetic resonance signal. This noncontact resonance measuring method is advantageous for measuring the discharge rate of aggressive liquids. The primary measuring element is a simple device which has low hydraulic resistance and the secondary instrument may be separated from the pickup unit by distances of more than 100 meters. Since the magnetic field of the earth is highly uniform, nuclear precession may be observed in large volumes, i. e. measurements of large liquid discharges are possible at low flow velocities through the pickup. The authors use units with a cross section of up to 36 cm². The proposed method may be used for measuring the discharge of a liquid flowing in any direction through the pickup. When the flow is reversed, the sign of the reading on the instrument is changed. Flow velocities down to approximately 1 cm/sec may be measured with no theoretical upper limit. The measurement error in the experiments conducted in this paper was $\pm(1.5-2)$ degrees. A change in the physical and chemical properties of the liquid (temperature, viscosity, transparency, elec-

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L 21827-66

ACC NR: AT6004614

trical conductivity, chemical composition, aggressiveness, etc.) has no effect on measurement results. Natural changes in the magnetic field of the earth and instability in the power supplies for the electric circuits have practically no effect on the results of measurements. The authors are sincerely grateful to Senior Engineer A. V. Mel'nikov for helping with the measurements and discussing various problems in the experimental work. Orig. art. has: 12 figures, 1 table, 9 formulas.

SUB CODE: 20/

SUBM DATE: 03Nov65/

ORIG REF: 003/

OTH REF: 001

Card 3/3

ACC NR: AP6007688
SOURCE CODE: UR/0413/66/000/003/0068/0069

AUTHOR: Borodin, P. M.

ORG: none

TITLE: Method and device for measuring liquid flow rate. Class 42, No. 178511

SOURCE: Izobreteniya, promyshlennyye obraztzy, tovarnyye znaki, no. 3, 1966, 68-69

TOPIC TAGS: flow meter, liquid flow, nuclear magnetic resonance

ABSTRACT: This Author Certificate presents a method and device for measuring liquid flow rate. The method is based on the phenomenon of nuclear magnetic resonance (NMR). To measure the flow rate of liquids having a strong NMR signal, the free nuclear precession in the magnetic field of the earth is utilized. The device utilizing this method contains a detector and a measuring device. The NMR detector is made in the form of two toroids. The monitored liquid flows through the toroids in series but in different directions. The phase shift of the emf induced in the toroid windings is proportional to the liquid flow rate.

SUB CODE: 20/

SUBM DATE: 29Dec62

Card 1/1 *fr*

UDC: 681.12.082.7

SHALAYEV, V.V.; BURKSER, V.Ye.; BORODIN, P.P.; D'YACHKOV, P.N.; PURGIN, A.K.;
BOL'SHAKOV, I.P.

Testing dinas concrete blocks in blooming mill soaking pits.
Ogneupory 27 no.6: ~~264-269~~ '62. (MIRA 15:5)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Shalayev, Burkser, Borodin).
 2. Vostochnyy institut ogneuporov (for D'yachkov, Purgin, Bol'shakov).
- (Firebrick) (Refractory concrete) (Furnaces, Heating)

1. BORODIN, P. V.
2. USSR (600)
4. Hydraulic Engineering
7. Popular scientific-technical series for workers.of the great communist construction projects. Gidr.stroi. 21 no. 10 1952
9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

BORODIN, P.V., kandidat tekhnicheskikh nauk; MIKLASHEVSKIY, Ye.P.,
professor, doktor tekhnicheskikh nauk.

"Sheathing of massive hydroelectric power plant structures." V.V.
Ermolov, G.D.Petrov. Reviewed by P.V.Borodin, E.P.Miklashevskii.
Gidr.stroi 23 no.6:47-48 '54. (MLRA 7:9)
(Ermolov, V.V.) (Petrov, G.D.) (Concrete construction--
Formwork)

DZHEKOVSKIY, N.N., professor, doktor tekhnicheskikh nauk; BLIZNYAK, Ye.V., professor; GUBIN, F.F., professor; ABRAMOV, N.N. professor ROZANOV, N.P., VORONOV, P.A., BORODIN, P.V., POSIEDOV, M.A. YUREVICH, D.P., PERSON, M.N., tekhnicheskiiy redaktor.

[Introduction to hydraulic engineering] Vvedenie v gidrotekhniku.
Moskva, Gos.izd-vo lit-ry po stroit. i arkhitekt. 1955. 301 p.
(Hydraulic engineering) (MLRA 8;8)

Borodin, P. V.

AID P - 3937

Subject : USSR/Hydr, Eng.

Card 1/1 Pub. 35 - 1/19

Authors : Konikh, V. V. (Dneprostroy) Platonov, V. A. (Gidromekhanizatsiya), Engs; Borodin, P. V. Kand. Tech. Sci. (MISI), Dement'yev, M. A., Dr. Techn. Sci. (VNIIG) and Gal'perin, R. S. Eng. (Gidroproyekt)

Title : The damming of the Dnepr River at the Kakhovka hydro-power construction.

Periodical : Gidr. stroi., 7, 1-6, 1955

Abstract : The article describes the hydraulic fill method used to build the earth fill without a rock toe in the Kakhovka Dam construction. Some flow data are given. The equipment used and the earth and rock work are described in great detail. Four diagrams.

Institution : None

Submitted : No date

BORODIN, P. V.

BELYAKOV, A.A.; ERISTOV, V.S.; DEMENT'YEV, M.A.; BORODIN, P.V.; FOGEL'SON,
S.B.; PLATONOV, V.A.; IORISH, Ye.L.; GAL'PERIN, R.S.

Letter to the editors. Gidr. stroi. 26 no. 4: 52-53 Ap '57.
(Dans) (MLRA 10:6)

BORODIN, P.V.

ANDON'YEV, V.L.; BAUM, V.A.; BAUMGARTEN, N.K.; BEREZIN, V.D.; BIRYUKOV, I.K.;
BIRYUKOV, S.M.; BLOKHIN, S.I.; BOROVY, G.A.; BULEV, M.Z.; BURAKOV,
N.A.; VERTSAYZER, B.A.; VOVK, G.M.; VORMAN, B.A.; VOSHCHININ, A.P.;
GALAKTIONOV, V.D., kand. tekhn. nauk; GENKIN, Ye.M.; GIL'DENELAT,
Ya.D., kand. tekhn. nauk; GINZBURG, M.M.; GLEBOV, P.S.; GODES, E.G.;
GORBACHEV, V.N.; GRZHIT, B.V.; GREKULOV, L.P., kand. s.-kh. nauk;
GRODZINSKAYA, I.Ye.; DANILOV, A.G.; DMITRIYEV, I.G.; DMITRIYENKO,
Yu.D.; DOBROKHOTOV, D.D.; DUBININ, L.G.; DUNDUKOV, M.D.; ZHOLIK,
A.P.; ZENKEVICH, D.K.; ZIMAREV, Ye.V.; ZIMASKOV, S.V.; ZUBRIK, K.M.;
KARANOV, I.F.; KNYAZEV, S.N.; KOLEGAYEV, N.M.; KOMAREVSKIY, V.T.;
KOSENKO, V.P.; KORENISTOV, D.V.; KOSTROV, I.N.; KOTLYARSKIY, D.M.;
KRIVSKIY, M.N.; KUZNETSOV, A.Ye.; LAGAR'KOV, N.I.; LGALOV, V.G.;
LIKHACHEV, V.P.; LOGUNOV, P.I.; MATSKEVICH, K.F.; MEL'NICHENKO,
K.I.; MENDELEVICH, I.R.; MIKHAYLOV, A.V., kand. tekhn. nauk;
MUSIYEVA, R.N.; NATANSON, A.V.; NIKITEN, M.V.; OYES, I.S.;
OGUL'NIK, G.R.; OSIPOV, A.D.; OSMER, N.A.; PETROV, V.I.; PERYSHKIN,
G.A., prof.; P'YANKOVA, Ye.V.; RAPOPORT, Ye.D.; REMEZOV, N.P.;
ROZANOV, M.P., kand. biol. nauk; ROCHEGOV, A.G.; RUBINCHIK, A.M.;
RYBCHESVSKIY, V.S.; SADCHIKOV, A.V.; SEMENTSOV, V.A.; SIDENKO, P.M.;
SINYAVSKAYA, V.T.; SITAROVA, M.N.; SOSNOVIKOV, K.S.; STAVITSKIY,
Ye.A.; STOLYAROV, B.P. [deceased]; SUDZILOVSKIY, A.O.; SYRTSOVA,
Ye.D., kand. tekhn. nauk; FILIPPSKIY, V.P.; KHALTURIN, A.D.;
TSISHEVSKIY, P.M.; CHERKASOV, M.I.; CHERNYSHEV, A.A.; CHUSOVITIN,
N.A.; SHESTOPAL, A.O.; SHEKHTER, P.A.; SHISHKO, G.A.; SHCHERBINA,
I.N.; ENGEL', F.F.; YAKOBSON, A.G.; YAKUBOV, P.A., ARKHANGEL'SKIY,
(Continued on next card)

ANDON'YEV, V.L.... (continued) Card 2.

Ye.A., retsenzent, red.; AKHUTIN, A.N., retsenzent, red.; BALASHOV, Yu.S., retsenzent, red.; BARABANOV, V.A., retsenzent, red.; BATUNER, P.D., retsenzent, red.; BORODIN, P.V., kand. tekhn. nauk, retsenzent, red.; VALUTSKIY, I.I., kand. tekhn. nauk, retsenzent, red.; GRIGOR'YEV, V.M., kand. tekhn. nauk, retsenzent, red.; GUBIN, M.F., retsenzent, red.; GUDAYEV, I.N., retsenzent, red.; YERMOLOV, A.I., kand. tekhn. nauk, retsenzent, red.; KARAULOV, B.F., retsenzent, red.; KRITSKIY, S.N., doktor tekhn. nauk, retsenzent, red.; LIKIN, V.V., retsenzent, red.; LUKIN, V.V., retsenzent, red.; LUSKIN, Z.D., retsenzent, red.; MATRIROSOV, A.Kh., retsenzent, red.; MENDELEYEV, D.M., retsenzent, red.; MENKEL', M.F., doktor tekhn. nauk, retsenzent, red.; OBRZHKOV, S.S., retsenzent, red.; PETRASHEN', P.N., retsenzent, red.; POLYAKOV, L.M., retsenzent, red.; RUMYANTSSEV, A.M., retsenzent, red.; RYABCHIKOV, Ye.I., retsenzent, red.; STASENKOV, N.G., retsenzent, red.; TAKANAYEV, P.F., retsenzent, red.; TARANOVSKIY, S.V., prof., doktor tekhn. nauk, retsenzent, red.; TIZDEL', R.R., retsenzent, red.; FEDOROV, Ye.M., retsenzent, red.; SHIVYAKOV, M.N., retsenzent, red.; SHMAKOV, M.I., retsenzent, red.; ZHUK, S.Ya. [deceased], akademik, glavnyy red.; RUSO, G.A., kand. tekhn. nauk, red.; FILIMONOV, N.A., red.; VOLKOV, L.N., red.; GRISHIN, M.M., red.; ZHURIN, V.D., prof., doktor tekhn. nauk, red.; KOSTROV, I.N., red.; LIKHACHEV, V.P., red.; MEDVEDEV, V.M., kand. tekhn. nauk, red.; MIKHAYLOV, A.V., kand. tekhn. nauk, red.; PETROV, G.D., red.; RAZIN, N.V., red.; SOBOLEV, V.P., red.; FERINGER, B.P., red.; FREYGOFER, (Continued on next card)

ANDON'YEV, V.L.... (continued) Card 3.

Ye.F., red.; TSYPLAKOV, V.D. [deceased], red.; KORABLINOV, P.N.,
tekhn. red.; GEMKIN, Ye.M., tekhn. red.; KACHEROVSKIY, N.V., tekhn.
red.

[Volga-Don; technical account of the construction of the V.I. Lenin
Volga-Don Navigation Canal, the TSimlyansk Hydroelectric Center,
and irrigation systems] Volgo-Don; tekhnicheskii otchet o stroitel'-
stve Volgo-Donskogo sudokhodnogo kanala imeni V.I. Lenina, TSim-
lianskogo gidrouzla i orositel'nykh sooruzhenii, 1949-1952; v piati
tomakh. Moskva, Gos. energ. izd-vo. Vol.1. [General structural
descriptions] Obshchee opisanie sooruzhenii. Glav. red. S.IA. Zhuk.
Red. toma M.M. Grishin. 1957. 319 p. Vol.2. [Organization of con-
struction. Specialized operations in hydraulic engineering] Orga-
nizatsiia stroitel'stva. Spetsial'nye gidrotekhnicheskie raboty.

(Continued on next card)

ANDON'YEV, V.I.... (continued) Card 4.

Glav. red. S. I.A. Zhuk. Red. toma I.N. Kostrov. 1958. 319 p.

(MIRA 11:9)

1. Russia (1923- . U.S.S.R.) Ministerstvo elektrostantsii. Byuro tekhnicheskogo otcheta o stroitel'stve Volgo-Dona. 2. Chlen-korrespondent Akademii nauk SSSR (for Akhutin). 3. Deystvitel'nyy chlen Akademii stroitel'stva i arkhitektury SSSR (for Grishin, Razin).

(Volga Don Canal--Hydraulic engineering)

SOV/98-59-8-3/33

8(6), 14(6)

AUTHOR: Borodin, P.V., Candidate of Technical Sciences

TITLE: Experience Gained From River-Bed Crossings in the USSR

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1959, Nr 8, pp 5-11 (USSR)

ABSTRACT: The article consists of a survey of 15 river-bed spannings, effected between October 1950 and January 1959, and of the lessons learnt from them. Table 1 contains data concerning the names of the crossings, the method used (10 frontal, 4 pioneer, and 1 banket), and the dates (September and October, but the Kakhovka, Kemerovskaya and Irkutsk GES are exceptions). Due to the short time available for the construction work, and in order to avoid wastage of material, it is necessary to forecast the streamflow as accurately as possible; table 1 also shows the main materials used in the projects (50% constructed from local supplies). Table 2 provides the principal statistics concerning the spannings, and table 3 contains data on the initial specific streamflow in the center-gap and of its magnitude before and after the cofferdams are dismantled. It was proved that there are 3 different drops in the

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SOV/98-59-8-3/33

Experience Gained From River-Bed Crossings in the USSR

banket - the critical drop (Z_{kr}), the outlet drop (Z_{vykh}), and the final drop (Z_{kon}) (Table 4), and the relation between these values is indicated in the table and at some length in the text. Details are then given of a system, developed by Professor S.V. Izbash and used by the V.V. Kuybyshev MISI, by which the amount of filtration and accumulation in the upper water is used to calculate the strength of the streamflow at the time of the closing of the gap in the span. This is expressed thus: $Q_r = Q_{ot} + Q_{bn} + Q_f + Q_{ak}$, where Q_{ot} , Q_{bn} , Q_f and Q_{ak} are respectively the streams passing through the outlet pipe, that spilling over the crest of the banket, that filtering through the body of the banket, and that accumulated in the upper water. The drop in the level at the banket, including losses via the outlet duct, is $Z_{bn} = f(Q_{oi})$, where Q_{oi} is the stream passed through the outlet pipe and Z_{bn} is given. The rate of growth of a banket of triangular cross-section is

Card 2/4

$$h_2 = \sqrt{\frac{u \cdot t}{m_{sr}} + h^2}, \text{ where } h_2 \text{ is the height of the banket after a}$$

SOV/98-59-8-3/33

Experience Gained From River-Bed Crossings in the USSR

certain period of time; h_1 is the initial height of the basket, u is the rate of deposit of stones in m^3 per hour, t is the estimated period of time in hours, and m_{sr} is the average coefficient of the slope of the basket. The complete filtration stream through the triangular cross-section is

$$Q_f = K \cdot B \cdot h \sqrt{\frac{Z_{bn}}{1.7 \cdot h}}, \text{ where } h \text{ is the}$$

height of the basket, Z_{bn} is the drop at the basket, B is the width of the gap, and K is the coefficient of turbulent filtration. The filtration capacity of the basket is $Q_{bn} = m_{\sigma} \sigma_{\pi} B \sqrt{2gH_0^{3/2}}$, where

m_{σ} is the coefficient of discharge, σ_{π} is the coefficient of immersion, B is the width of the gap, and H_0 is the pressure on the crest of the basket. The water accumulated in the upper water is estimated by the formula

$$Q_{ak} = \frac{\Delta W_{vod}}{\Delta t}, \text{ where } W_{vod} \text{ is the increase}$$

in the volume of the reservoir during the time Δt as a result of the increase in the height of the basket to h_2 . All these calcula-

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SOV/98-59-8-3/33

Experience Gained From River-Bed Crossings in the USSR

tions and formulae are shown in graph form in fig.1. Details are then given concerning the actual methods of construction used on the projects, and data pertaining to the machinery used is given in tables 6 and 7, on which is based the formula

$$K'_n = \frac{i_{\max}}{i_{sr}} \quad \text{and}$$

$$K''_n = \frac{i_{\max}}{i_{\min}} \quad (\text{coefficients of unevenness of dumping}); \text{ additional}$$

formulae given are for the rate of dumping ($i = \frac{60}{t'}$, where t' is the interval between dumpings in minutes), and for the same when the width of the gap B is taken into consideration ($i_u = \frac{i}{B} = \frac{60}{t'B}$). There are 7 tables, 2 graphs, and 4 Soviet references.

Card 4/4

BORODIN, P.V., kand. tekhn. nauk

Methods of determining the strength of concrete in structures.
Gidr. stroi. 32 no.3:16-19 Mr '62. (MIRA 16:7)

(Concrete-- Testing)

BORODIN, R. V.

35866

Opredeleniye zapasov podzemnykh vod na opyte gidrogeologicheskikh
issledovaniy v rayonakh rudnykh mestorozhdeniy sredney AZII. Trudy
In-ta geologii (akad. nauk uzbek. SSR), VYP 3, 1949, C. 106-19.--
rezyume na uzbyek. Yaz--Bibliogr: 8 lazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 39, Moskva, 1949.

BORODIN, B.V.

Classifying underground water resources according to the reliability
of data on their potential use as sources of water supply. Zap. Uz.
otd. Vses. min. ob-va no.11:53-64 '57. (MIRA 11:6)
(Water, Underground)

BORODIN, R.V.

Studying the filtration properties of greatly permeable alluvial
pebbles. Uzb. geol. zhur. no.4:19-34 '58. (MIRA 13:2)

1.Sredneaziatskiy gosudarstvennyy universitet im. V.I. Lenina.
(Pebbles--Permeability)

BORODIN, R.V.

New method for studying the filtration properties of alluvial
gravel. Dokl.AN Uz.SSR no.9:11-15 '58. (MIRA 11:12)

1. Institut geologii AN UzSSR. Predstavleno chlenom-korrespondentom
AN UzSSR G.A.Mavlyanovym.
(Angren Valley--Alluvium) (Water, Underground)

BORODIN, S.; UTROBIN, N.; BALANDIN, A.; TEMEROV, N.; VENGEROV, A.;
LILOV, A.

Readers report, advise, and offer help. Zhil.-kom.khoz. 12
no.6:26-27 Je '62. (MIRA 15:12)

1. Predsedatel' zhilishchnoy komissii Leninskogo rayonnogo
soveta g. Ivanovo (for Borodin). 2. Instruktor oblastnogo
ispolnitel'nogo komiteta, g. Kirov (for Utrobin). 3. Nachal'nik
planovo-proizvodstvennogo otdela Zhilishchnogo-kommunal'nogo
upravleniya g. Zyryanovsk, Vostochno-Kazakhstanskoy obl. (for
Vengerov). 4. Direktor Doma kul'tury, g. Chernovtsy, UkrSSR.
(for Lilov).

(Housing management)

BORODIN, S., kapitan dal'nego plavaniya

Loading mahogany in the Takoradi harbor, in Ghana. Mor. flot 23
no.6:13-14 Je '63. (MIRA 16:9)

1. Starshiy shturman teplokhoda "Makhtra".
(Takoradi--Cargo handling) (Mahogany--Transportation)

BORODIN, S.A.

Twisted pyrites from the Kalanguy deposit. Zap.Vses.min.ob-va
90 no.5:578-585 '61. (MIRA 14:10)

1. Kafedra mineralogii Moskovskogo gosudarstvennogo universiteta.
(Transbaikalia--Pyrites)

BORCHIE, P.A.

Gigantic spiral on the face of pyrite. Sap. Vaes. min.
ob-va 92 no.3:341-343 '63. (MIRA 17:9)

1. Institut geokhimi i analiticheskoy khimii imeni Vernadskogo
AN SSSR, Moskva.

BORODIN, Stepan Vasil'yevich; DEMICHEV, Aleksandr Nikolayevich;
ROZIN, Pavel Iosifovich. Prinimali uchastiye:
TOCHIL'NIKOVA, G.M.; KARCHEVSKIY, V.N.; FILIPPOVA, E.,
red.izd-va; LEBEDEV, A., tekhn. red.

[Finance and credit] ~~Finansy~~ i kredit. Moskva, Gosfin-
izdat, 1963. 222 p. (MIRA 17:2)

BORODIN, S. V.

USSR/Electronics - Communications

Card 1/1 Pub. 133 - 4/16

Authors : Borodin, S. V.; Minashin, V. P.; and Sokolov, A. V.

Title : High frequency apparatus for radio relay communication lines

Periodical : Vest. svyazi 5, 7-10, May 1955

Abstract : A description of the operation and construction of component parts of high frequency apparatus used in telephone communications relay stations, is given. The apparatus is used in conjunction with duplex operation of wide-band frequency, condensed at the central K-24 station for a simultaneous transmission and reception of 24 telephone signals. Illustrations; drawing; diagrams.

Institution:

Submitted :

See also: BORODINA, S.V.

MAL'TSEV, V.; BORODIN, V.; SINYAVSKIY, V.; CHURAKOVA, N.

Siberia and the Far East must have their own good health resorts!
Okhr.truda i sets.strakh. no.5:49-53 My '59.(MIRA 12:9)

1. Predsedatel' Chabarovskogo krayevogo soveta profsoyuzov (for Mal'tsev). 2. Predsedatel' Sakhalinskogo oblastnogo soveta profsoyuzov (for Borodin). 3. Predsedatel' Chitinskogo oblastnogo soveta profsoyuzov (for Sinyavskiy).

(Soviet Far East--Health resorts, watering places, etc.)

(Siberia--Health resorts, watering places, etc.)

GAKICHKO, S., kand. tekhn. nauk; PENSKAYA, K.; BORODIN, V.; BORNOVALOVA, A.

Thawing out of blocks of small fish. Khol. tekhn. 35 no. 3:39-44
My-Je '58. (MIRA 11:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kholodil'noy
promyshlennosti.

(Fish, Frozen)

ROZOV, Yu. (Moskva); BORODIN, Y. (pos. Tuchkovo); SHIFRIN, A. (Leningrad);
BONDARENKO, P. (pos. Belyy Kolodez'); VOROVICH, B. (st. Yarmolintsy)

Readers exchange practices. Sov.foto 19 no.11:61-62 H '59.
(MIRA 13:4)

(Photography--Equipment and supplies)

S/738/60/000/001/001/001

AUTHOR: Borodin, V.

TITLE: The grouped machining of odd-shaped parts in a line-type production layout.

SOURCE: Moscow. Tsentral'nyy institut tekhniko-ekonomicheskoy informatsii. Peredovoy nauchno-tekhnicheskiy i proizvodstvennyy opyt. pt.1: Opyt vnedreniya gruppovoy obrabotki detaley v mekhano-sborochnyykh tsekhakh mashinostroitel'nykh zavodov; sbornik. Moscow.1960, 122-138.

TEXT: The paper describes the grouped machining of connecting rods within a line-type production layout introduced by the All-Union Design-Technology Institute jointly with workers of the Kolomenskoye Diesel-Locomotive Factory. Previously, universal machines, with their repeated time-consuming setup alterations, had been utilized no more than 40-50% and many of the special machine tools only 10-15%. The complex and mixed-up travel line of the parts between the various machine tools did not even permit the establishment of normal mechanized transportation. The basic improvement adduced was the introduction of grouped jigs for the simultaneous performance of identical machine-tool operations. This entailed product-design improvements comprising: (1) A closer approach of billet dimensions to final

Card 1/4

The grouped machining of odd-shaped parts ...

S/738/60/000/001/001/001

dimensions; (2) provision of an initial reference or base surface to permit the first machining operation to be performed without preliminary lofting. The base surface (BS) must meet the following requirements: (1) The selected BS must permit the greatest possible number of precision operations; (2) the BS of various parts must be identified to facilitate holding in the grouped jig. Various complex machining operations were studied, and a maximal mechanization was sought, especially in the transportation of heavy parts. After review of existing equipment, the following general trends were explored: (1) Replacement of costly and cumbersome boring lathes and horizontal boring machines with less expensive, compact, drill presses and milling machines; (2) verification of the effective working time of each machine; (3) increase in workload of the specialized machines to the benefit of the overloaded universal machines. Detailed examples are reported, and a saving of 300,000 rubles in the purchase of new equipment is claimed. Graphic analysis and experimental work led to multiple utilization of a given machine and to the grouping of operations such as the final milling of the seating surfaces of the connecting rod and the big-end head, which improved the machine utilization from 18-20 to 50-55%. A 12-spindle drilling machine was altered to permit a broader range of operations (described), thus making the purchase of a radial-drilling machine unnecessary. In attempting to arrive at a line-type arrangement of machine tools, it was found that a straight-line arrangement for all types of parts was impossible. Hence a

Card 2/4

The grouped machining of odd-shaped parts ...

S/738/60/000/001/001/001

representative key part (RKP) was chosen to satisfy the following requirements:

(1) The RKP must be typical in design and geometry for the given group of parts; (2) the operations required for the RKP must be likewise typical; (3) the RKP must be more massive, complex, and difficult than the other parts of its group. The flow-line analysis yielded an optimal flow-line geometry, consolidation of operations groups on universal machines, selection of the most effective means of locomotion.

Details of the shifting of individual machines, changes in process technology, etc., are described. Lastly, the grouping of parts for a given machining operation was sought, so that (1) the grouping of machining operations does not impair the flow of other operations; (2) the assemblage of operations must afford a convenient and dependable design for the grouped jig; (3) the working volume thus achieved should occupy as much of the operating time of the machine as possible. 25 different

milling operations were broken up into 3 groups. As a result of the analysis 19 grouped jigs were designed for use in 119 different operations (45% of all machining operations).

A full-page figure shows one of the grouped jigs for the milling of base surfaces on 12 billets of four different parts, with provision for repeat operation after heat treatment. Grouped jig for milling on the vertical milling machine

6H13 (6N13): A full-page drawing shows a jig which serves 10 different milling operations on 3 types of parts differing substantially both in design and size; the grouped jig replaced 8 individual jigs previously employed. Full-page drawings

Card 3/4

The grouped machining of odd-shaped parts ...

S/738/60/000/001/001/001

and detailed descriptions are provided for a grouped jig for the milling of curvilinear surfaces on the 6N13 milling machines, a 12-spindle drilling machine (the jig serves 8 different parts weighing up to 150 kg), a vertical drill press of the type 2170, and a 1,000-mm diam boring and turning lathe. Concluding remarks emphasize the effectiveness of the measures and equipments proposed and tested. There are 6 figures; no tables or references. Ed. by Engineer S. A. Vasil'yev.

ASSOCIATION: None given.

Card 4/4

BORODIN, V.A.

Regulating equipment repair. Tekst.prom. 14 no.8:54 Ag '54.
(MLRA 7:10)
(Textile machinery--Maintenance and repair)

MUKHACHEV, G.A., kand. tekhn. nauk; BORODIN, V.A., inzh.; POSKONIN, Yu.A.,
inzh.

I-s diagram for water vapor at low temperatures and pressures.
Teploenergetika 10 no.10:89-92 0'63 (MIRA 17:7)

1. Kazanskiy aviatsionnyy institut.

Москва, М.А.

ANOKHIN, SERGEI NIKOLAEVICH, N. SIMONOV, and V. BORODIN.

Pariashchii polet. Moskva, Molodaia gvardia, 1934. 94 p.,
illus., ports., maps. (Masterya sovetskogo planerizma)
Title tr.: Soaring flight.

TL765.A63

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of
Congress, 1955.

BORODIN, V. A. and DITYAKIN, Yu. F.

"Gidravlicheskiy Udar v Truboprovode s Mestnymi Ob'yemami na Koutsakh"

M. Oborongiz 1949 16 pp.

Borodin, V. A., and Dilyakin, Yu. F. Unstable capillary waves on the surface of separation of two viscous fluids. Akad. Nauk SSSR, Prikl. Mat. Meh. 13, 265-276 (1949). (Russian)

Rayleigh a le premier fait l'étude théorique de la décomposition d'un jet liquide et a trouvé les conditions pour la formation des gouttes de même diamètre. D'autres auteurs ont amélioré la théorie en introduisant la viscosité et la densité du milieu environnant et ont obtenu des résultats en bonne concordance avec les expériences. Dans le présent mémoire les auteurs étudient pour la première fois la possibilité de formation des gouttes de différents diamètres en étudiant les ondes capillaires instables à la surface de séparation de deux fluides visqueux.

Pour simplifier le problème et paramétrer l'étude algébrique de l'équation caractéristique les auteurs supposent que le rayon du jet est infiniment grand par rapport aux longueurs des ondes capillaires à la surface du jet liquide. Evidemment cette hypothèse est trop grossière dans l'étude d'un phénomène aussi complexe, mais grâce à elle on peut avoir une idée qualitative du mode de formation des gouttes de différents diamètres. En supposant les deux fluides non pesants et incompressibles et en négligeant les infiniment petits de second ordre des vitesses perturbées ainsi que de leurs dérivées jusqu'au troisième ordre, les auteurs obtiennent en utilisant l'équation de Navier-Stokes et l'équation de continuité, deux équations aux dérivées partielles linéarisées de la forme de Helmholtz, l'une pour le premier fluide, l'autre pour le second.

En introduisant les conditions aux limites et en supposant les fluides immobiles et ayant le même coefficient de viscosité on obtient une équation caractéristique qui est un polynôme de huitième degré dont les coefficients dépendent de deux paramètres. L'étude de cette équation pour ses valeurs positives des paramètres permet de démontrer l'existence à la surface de séparation de trois ondes instables.

M. Kuvshinov (Paris).

Source: Mathematical Reviews,

Vol 11 No. 11

BORODIN, V. A.

PHASE I

TREASURE ISLAND BIBLIOGRAPHICAL REPORT

AID 694 - I

BOOK

Call No.: AF369704

Author: BORODIN, V. A.

Full Title: AIRCRAFT MODEL PULSE JET

Transliterated Title: Aviamodel'nyy pul'siruyushchiy vozdushno-reaktivnyy dvigatel'

PUBLISHING DATA

Originating Agency: None

Publishing House: Main Administration of Publishing Houses of the War Department of the USSR

Date: 1951

No. pp.: 96

No. of copies: Not given

Editorial Staff: None

PURPOSE: Textbook for aircraft model makers

TEXT DATA

Coverage: This is a popular booklet about the elementary theory, design and operation of model pulse jets. In particular the author gives general information on jet engines, design and assembly of the model pulse jet B-10, special features of pulse jet model aircraft, and the model pulse jet B-12. Diagrams, construction drawings, specifications.

No. of References: Russian 4, 1938-1949

Facilities: None

1/1

3
Borodin, V. A., and Dityakin, Y. F. Unstable capillary
waves on surface of separation of two viscous fluids.
Tech. Memos. Nat. Adv. Comm. Aeronaut., no. 1281,
19 pp. (1951).
Translated from Akad. Nauk SSSR. Prikl. Mat. Meh. 13,
267-276 (1949); these Rev. 11, 66.
Source: Mathematical Reviews,

Vol 12 No. 7.

3944. Borodin, V. A., and Dittakin, Yu F., Stability of plane flows of viscous fluid between two surfaces (in Russian), *Pribl. Mat. Mekh.* 17, 3, 569-578, Sept./Oct. 1953.

Lin's conclusion on the same problem which shows the existence of unstable laminar flow for large Reynolds number was not confirmed by experiment. The discrepancy between the theory and the experiment is considered as due to the imperfections of the method of mathematical analysis. In 1940, G. I. Petrov showed that the flow through a tube or between two plates is stable, using Galerkin's method. However, Tollmien gave that the flow is unstable when the velocity distribution has a turning point.

Authors show the existence of unstable laminar flow between two plates with an unsymmetrical velocity distribution. The critical Reynolds number is obtained to be 340. The reviewer believes that the turning point in Tollmien's theory is the point on the boundary of sublayer of turbulent boundary layer, and the laminar boundary layer is always stable unless the flow transits to turbulent.

M. Kataoka, Japan

5-6-55

Borodin, V. A.

S/179/60/000/02/008/032
E191/E281

AUTHORS: Borodin, V. A., and Dityakin, Yu. F.
(Moscow)

TITLE: On the Shape of the Liquid Film Produced by a Centrifugal Atomiser

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, Nr 2, pp 60-64 (USSR)

ABSTRACT: Reference is made to the investigation by Euteneuer, G.A., (Ref 5) on the effect of surface tension in the formation of hollow liquid jets. In his analysis, Euteneuer considered the dynamic equilibrium of a film element which led to the clarification of the wavy nature of the shape of the film as a function of the Weber number. Using the equation of equilibrium of a liquid film as derived by Euteneuer, an analysis of the equilibrium form of such a film is carried out. Starting from the expression for the radial component of velocity of liquid particles in the film, and assuming that the axial

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E191/E281

On the Shape of the Liquid Film Produced by a Centrifugal Atomiser

velocity component is approximately constant, an equation is derived for the surface of such a film (Eq (1.5)). Using the theory of the centrifugal atomiser and introducing the Weber number and non-dimensional co-ordinates referred to the radius at which the radial acceleration vanishes under equilibrium conditions, the equation for the surface of the film is obtained in non-dimensional form. This equation is mathematically analysed to single out physically significant regions in terms of the two non-dimensional parameters of which one is the ratio of the mean radius of the annular jet to the radius of zero acceleration and the other is the reciprocal of this ratio multiplied by the reciprocal of the third root of the Weber number. This analysis makes it possible to evaluate the effect of the Weber number on the shape of the film. The film contours for different Weber numbers are shown on Fig 2. The larger the Weber number, the larger the apex angle, the maximum radius and the wavelength of the film

Card 2/3

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On the Shape of the Liquid Film Produced by a Centrifugal
Atomiser

surface. With increasing Weber number, the point of bursting of the film shifts nearer to the atomiser nozzle. Finally, after a short distance, the liquid forms a mist of droplets. Fig 3 shows the thickness of the film along the axis for different Weber numbers and Fig 4, the relation between the wavelength of the film surface and the Weber number. There are 4 figures and 5 references, 3 of which are Soviet, 1 German and 1 English.

SUBMITTED: November 20, 1959

Card 3/3

1/7

34372

S/207/62/000/001/013/018
B108/B104

117420

AUTHORS: Borodin, V. A., Dityakin, Yu. F., Yagodkin, V. I. (Moscow)

TITLE: Disintegration of a spherical drop in a gas blast

PERIODICAL: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 1,
1962, 85 - 92

TEXT: The authors calculate the axially symmetrical perturbations of a drop of an ideal liquid moving in (or flowed around by) another ideal liquid. The coordinate origin is to be in the center of the spherical drop. Starting from the Laplace equation in spherical coordinates, the Weber's number and the shape of the perturbations are calculated (Table 2). Similar results have been obtained for the motion of a gas bubble in a liquid (Ref. 4, see below). The results show that the pressure distribution over the surface of the drop has only a slight effect on the splitting of the drop. This is due, however, to the assumption of a potential flow embedding the drop. The authors thank L. N. Britnev for assistance in the calculations. There are 1 figure, 2 tables, and 8 references: 3 Soviet and 5 non-Soviet. The references to the English-Card (11) 2

Disintegration of a spherical drop...

S/207/62/000/001/013/018
B108/B104

language publications read as follows: Hinze J. O. Amer. Inst. Chem. Eng. Journ., 1955, I, pp. 200 - 209; Isshiki M. Rept. Transp. Techn. Research Inst., 1959, no. 35; Ref. 4: Hartunian R. A., Sears W. R. Journ. Fluid Mech., 1957, v. 3, Part I, pp 27 - 47.

SUBMITTED: September 28, 1961

Table 2. Weber's number W and shape of perturbation.
Legend: (A) Shape of perturbation (either - or). (1) Motion in direction of stream, (2) splitting in the stream direction or formation of tore, (3) formation of two drops and a tore or of one tore, (4) formation of two drops and two tores or of one tore.

Card 2/2

BORODIN, V.A.; DITYAKIN, Yu.F.; YAGODKIN, V.I. (Moskva)

Mechanisms underlying the disintegration of a droplet moving
in a gas flow. PMTF no.3:100-104 My-Je '64. (MIRA 17:6)

ACCESSION NR: AP4041198

S/0207/64/000/003/0100/0104

AUTHORS: Borodin, V. A. (Moscow); Dityakin, Yu. F. (Moscow); Yagodkin, V. I. (Moscow)

TITLE: Mechanisms of shattering of drops moving in gas flow

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 3, 1964, 100-104

TOPIC TAGS: drop shattering, gas flow, ideal fluid, spherical drop, Weber number

ABSTRACT: In a previous paper (O droblenii sfericheskoy kapli v gazovom potoke. PMTF, 1962, No. 1) the authors made a theoretical study of unstable axisymmetric forms of perturbations of a spherical drop of ideal liquid flowed around by another ideal liquid, leading to its shattering. There they used the method of small perturbations to solve the problem. They found the critical value of the Weber number and determined the forms of neutral perturbations. In the present paper they consider the case of intensifying perturbations and also their forms for various values of the Weber number. On the basis of equations from the previous work, they conclude that for values of the Weber number $1.63 < W < 1000$ there are three possible forms of intensifying perturbations. From their deductions on the

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ACCESSION NR: AP4041198

various forms of perturbations arising with motion of a liquid spherical drop in the medium of another liquid, they find that the essential role in the shattering process is played by the effect of oscillation and discontinuity on part of the liquid torus. They investigate the fact that the number of crests arising on the torus can be two, three, or more, decreasing as the diameter of the torus decreases. Comparison of their results with experiments can be made for very slowly moving toruses. Orig. art. has: 4 figures and 13 formulas.

ASSOCIATION: none

SUBMITTED: 16Dec63

ENCL: 00

SUB CODE: ME

NO REF SOV: 003

OTHER: 002

Card 2/2

L 22633-65 EWP(n)/EPF(n)-2/EWT(1)/EWA(d) Pd-1/Pu-4 WW

ACCESSION NR: AP5002865

S/0207/64/000/005/0059/0065

AUTHOR: Borodin, V. A. (Moscow); Britneva, L. N. (Moscow);
Dityakin, Yu. F. (Moscow); Yagodkin, V. I. (Moscow) B

TITLE: Breakup of liquid jet overflowed by a gas stream

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 5, 1964, 59-65

TOPIC TAGS: liquid jet, liquid drop, transverse flow, fuel injection, jet breakup

ABSTRACT: The breakup of a cylindrical ideal liquid jet (radius a , density ρ_1) by the transverse flow of another ideal fluid (density ρ_2 , velocity U_0) was studied analytically. Two types of waves propagating along the jet surface were considered: 1) tangential waves deforming the jet in the plane of its cross section; 2) longitudinal waves. Time-dependent potential functions are introduced for the jet and the fluid in cylindrical coordinates, and the following solution is assumed

$$\Phi(r, \varphi, t) = u(r, \varphi) e^{-i\omega t}.$$

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ACCESSION NR: AP5002865

The continuity of the normal component of the velocity at the interface is used as a boundary condition. From Laplace's equation a generalized solution is obtained in the form

$$u_1 = \sum_{m=0}^{\infty} A_m R^m e^{im\varphi}, \quad u_2 = \sum_{m=0}^{\infty} B_m R^{-m} e^{im\varphi}.$$

For $m = 0$ and $R = 1$ the velocity of surface rise of the jet is given by

$$v_{r_0} = \frac{1}{a} \sum_{m=0}^{\infty} m A_m R^{m-1} \cos m\varphi e^{-1/2}$$

and the equations of nodal lines on the perturbed jet take the form of

$$\sum_{k=0}^{\infty} m A_m \cos m\varphi = 0$$

($m = 2k$ and $m = 2k + 1$)

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ACCESSION NR: AP5002865

Numerical calculations show that at $2 < W < 27.6$ (W = Weber number), four nodal lines appear on the jet surface and two nodal lines at $0.656 < W < 1.24$. To determine the wave propagation along the jet, the stream function is assumed to have the form

$$\Phi(r, \varphi, z, t) = u(r, \varphi)e^{-i\beta t + i\alpha z}$$

Substituting in the cylindrical Laplace equation, the solution is obtained in a Bessel function of imaginary arguments. Numerical results are obtained for $W = 5$ and 10 . Orig. art. has: 4 figures and 46 formulas. [04]

ASSOCIATION: none

SUBMITTED: 22May64

ENCL: 00

SUB CODE: ME

NO REF SOV: 007

OTHER: 004

ATD PRESS: 3170

Card 3/3

MUKHACHEV, G.A.; BORODIN, V.A.; POSKONIN, Yu.A.

Temperature dependence of the thermal and caloric parameters
of mercury. Zhur. fiz. khim. 39 no.8:2033-2036 Ag '65.
(MIRA 18:9)

L 18881-66 EWP(m)/EWP(k)/EWT(1)/EWT(m)/ETC(m)-6/T/EWA(d)/EWA(1)/EWP(w)/EWP(v) Em/
 ACC NR: AP6009049 WW/JW/WE SOURCE CODE: UR/0207/66/000/001/0058/0066

AUTHOR: Borodin, V. A. (Moscow); Dityakin, Yu. F. (Moscow); Yagodkin, V. I. (Moscow)

ORG: none

TITLE: Stability and disintegration of a cylindrical liquid film in a gaseous medium

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no. 1, 1966, 58-66

TOPIC TAGS: swirl atomizer, fuel injection, fuel injector, combustion, propulsion

ABSTRACT: To study the problem of liquid injection by swirl atomizers, an analysis was made of the break-up of a cylindrical liquid sheet issuing from a nozzle into a stagnant medium. Solutions were plotted in terms of the fluctuation increment vs. the wave number at various Weber numbers ranging from 2 to 15. Based on the results, the following conclusions were drawn: at small Weber numbers at the nozzle exit, waves, which are in the same phase, are generated on the outer and inner surface of the cylindrical sheet. Since the fluctuation amplitude increases rapidly, the annular liquid sheet is transformed into a continuous jet which disintegrates according to previously outlined mechanisms. At Weber numbers from 3-10, the fluctuations have the same wavelength as the thickness of the sheet so that the sheet expands considerably and thus can disintegrate. At $We > 10$, the wavelengths of the fluctuations are much shorter than the film thickness and the fluctuations on the inner

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L 18881-66

ACC NR: AP6009049

and outer surfaces are either in the same or in a different phase. In this case, droplets detach from the cylindrical sheet without causing disintegration. Orig. art. has: 9 figures and 50 formulas. [PV]

SUB CODE: 21/ SUBM DATE: 28Oct65/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 4217

Card

2/2

S/124/62/000/003/025/052
D237/D302

AUTHOR: Borodin, V.B.

TITLE: Velocity profiles in free convection in a viscous fluid

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 3, 1962, 93,
abstract 3B587 (Sb. Nauchn. tr. Permsk. politekhn.
in-t., 1960, no. 7, 1, 99 - 105)

TEXT: Results are given of the experimental investigation of a free flow of glycerin in a vertical cylindrical tube of length 610 mm and diameter 13.9 mm. Velocity of the fluid was measured by application of luminiscent particles. It was shown that the velocity profile differs from the theoretical, but the linear dependence of maximum velocity on the height is preserved. For the constant azimuthal temperature, axial symmetry of the flow was observed at significant distances from the heater. [Abstractor's note: Complete translation].

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Card 1/1

BORODIN, V. B.

"Investigation of free heat convection in a vertical cylinder filled with high-viscosity liquid."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Permskiy Polytechnic Inst.

PHASE I BOOK INFORMATION 807/2747

International Congress of Refrigeration. Moscow, 1959

Summukh collector at SSSR (collected Soviet Reports) Moscow, Gostorgizdat, 1959. 214 p. Russian slip inserted. 2,000 copies printed.

M. (title page); Sh. E. Kobulashvili; M. (inside book); E. V. Chikobava; Sobch. M.; V. V. Babicheva.

PURPOSE: This collection of articles is intended for those interested in the problems of food refrigeration.

CONTENTS: The collection contains 26 reports which were submitted at the meeting of the 3rd, 4th, and 5th Committees of the International Institute of Refrigeration. The meeting was held in Moscow, September 5-6, 1959, and was attended by 265 Soviet specialists and 15 representatives from other countries. The 13 reports discussed the problems of food refrigeration as the automation of the cooling of refrigerating installations, the use of flooded-type refrigerating devices, fast-freezing food products, the theory and technique of rapid cooling and freezing of meat and fish, the use of antibiotics in the cold storage of food products, the operation of refrigerators and cooling systems. A complete account of the proceedings of this meeting was published by the International Institute of Refrigeration in 1959. No personalities are mentioned. References follow several of the articles.

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Kan, E. D. [Izvestiya Vsesoyuznogo konstruktorskogo byuro khimicheskoy mashinostroyeniya (Central Design Office for the Building of Refrigeration Machinery)]. Heat and Mass Exchange in an Air-Cooler Provided With Helical Fins	53
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SOV/137-58-7-14646

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 100 (USSR)

AUTHORS: Lukashenko, E.Ye., Borodin, V.I.

TITLE: Intensification of the Aluminum Alloy Vacuum Dezincification Process (Intensifikatsiya protsessa vakuumnogo obestsinkovaniya alyuminiyevykh splavov)

PERIODICAL: Byul. Tsent. in-t inform. M-va tsvetn. metallurgii SSSR, 1957, Nr 2, pp 14-17

ABSTRACT: Laboratory investigations of the process are conducted showing that the evaporation of Zn from Al alloy is a surface process and depends upon equalization of the composition of the alloy. In connection therewith, changes have been made in the design of the closets of the vacuum distillation furnaces at the Podol'sk secondary metals plant in order to provide better circulation of the alloy; the number of channels has been changed, their cross section reduced, bath depth has been reduced, and thermal insulation increased. Permanent condensers were replaced by interchangeable ones, the condenser-throat cross sections were increased, and residual pressure was reduced. The results obtained with furnaces of modified design are adduced.

Card 1/1

L.P.

1. Aluminum alloys--Production 2. Zinc--Evaporation 3. Vacuum furnaces--Design 4. Vacuum furnaces--Equipment

BORODIN, V.I.; KOT, I.L.

Device for the winding of springs with folded supporting coils.
Ratsionalizatsiia no.10:21 '62.

BORODIN, V.I.; KOT, I.L.

Kiev innovators suggest. Mashinostroitel' no.5:38-39 My '62.
(Kiev--Technological innovations) (MIRA 15:5)

L 7959-66

ACC NR: AP5025738

SOURCE CODE: UR/0286/65/000/018/0088/0089

AUTHORS: Osipova, I. A.; Borodin, V. I.; Trushchelev, B. I.; Andreyeva, V. V. 3/

ORG: none

TITLE: Digital simulator. Class 42, No. 174834 [announced by State Committee for Radio Electronics SSSR (Organizatsiya gosudarstvennogo komiteta po radioelektronike SSSR)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 88-89

TOPIC TAGS: digital system, computer simulation

ABSTRACT: This Author Certificate presents a digital simulator for producing the function $Y = 1/X$ by the method of piecewise linear approximation. To reduce the required equipment and to eliminate the necessity for setting the circuit with preparation of the problem, the device contains a reversible counter whose occupation is proportional to the argument X , a frequency divider, and a binary multiplier. The frequency divider has a variable scaling coefficient for varying the slope of the approximating line and is controlled by the most significant digits of the counter. The binary multiplier, which is connected to the least

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UDC: 681.142.642

L 7959-66

ACC NR: AP5025738

significant digits of the counter, establishes the size of the approximation step within each segment depending on the occupation of the least significant digits of the reversible counter.

SUB CODE: DP/ SUBM DATE: 01Aug64

Card 2/2

STRAMKOVSKAYA, K.K.; BORODIN, V.K.; DINEL'T, V.M.

Reactivity of peat coke and the effect of the additions of ore
and fluxes. Izv.TPI 111:95-100 '61. (MIRA 16:9)

1. Predstavleno professorom doktorom I.V. Geblerom.
(Peat gasification) (Ores) (Fuel)

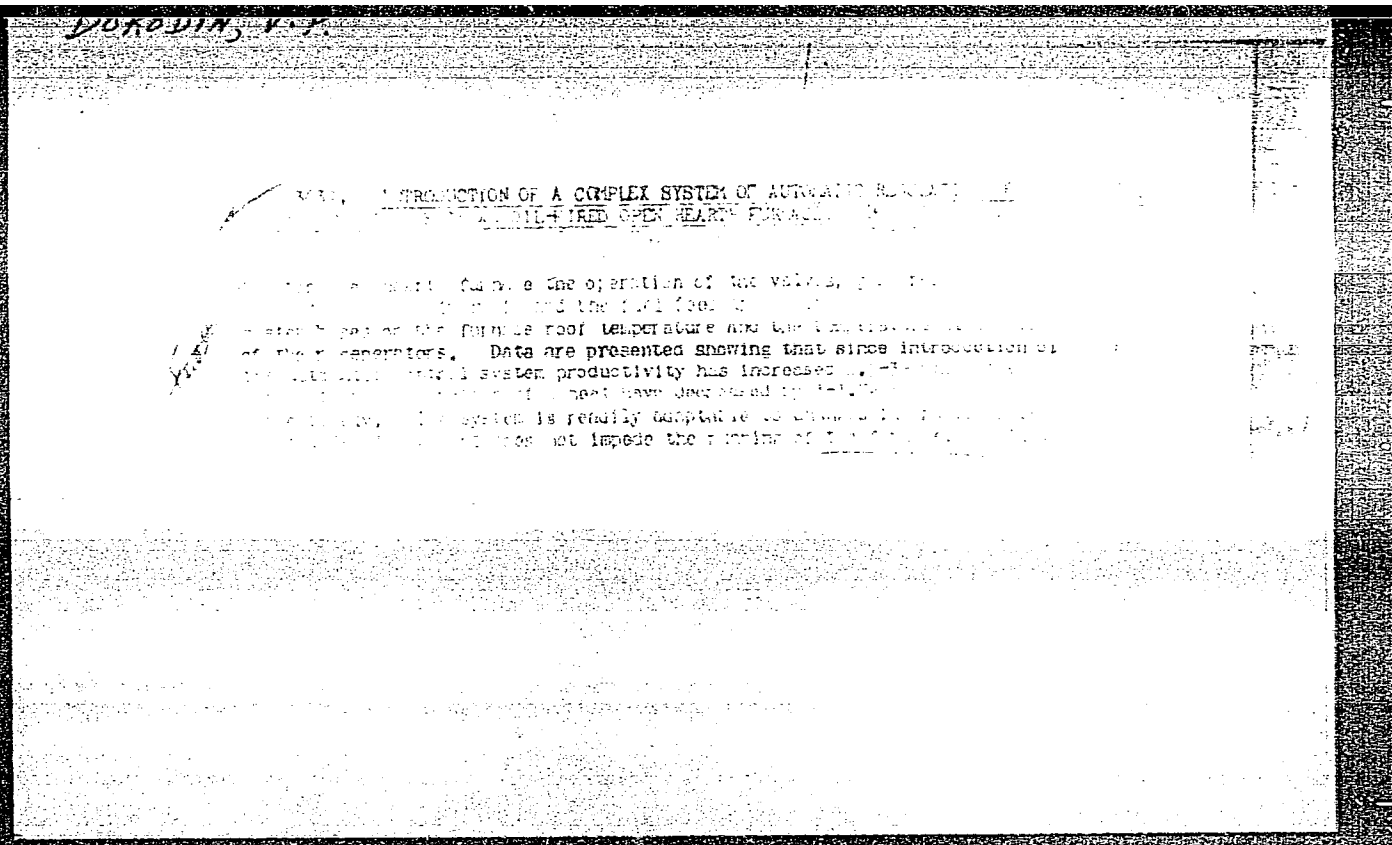
BORODIN, V.M., inzh.; LAMANOV, Yu.M., inzh.

Machine for loading rods. Gor. zhur no.4:49-51 Ap '63. (MIRA 16:4)

1. Nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut
gornogo i obogatitel'nogo oborudovaniya, Sverdlovsk.
(Loading and unloading)

BORODIN, V.M.

Compacting asbestos during packaging. Stroi.mat. 10 no.8:35-37 Ag '64.
(MIRA 17:12)



BORODIN, V. P.

6

18
Experiences in the Conversion of Open-Hearth Furnaces
to Natural-Gas Firing. V. P. Borodin, P. M. Garmanyan,
 I. A. Yudson and L. S. Shavandina. (Sov. 1957, (2), 124-
 125). [In Russian]. After a brief note on the economics and
 probable development of the use of natural gas in Soviet
 steel works, details are given of the operation of one basic
 and one acid-roof small (about 17.5 m² bottom area) O.H.
 furnaces fired with a natural gas/oil mixture at the "Krasnyi
 Oktyabr'" works. The first produced mainly carbon steel,
 the second ball-bearing steel; optimal conditions for the new
 practice, which is especially advantageous in producing
 quality and high-quality steels, are summarized. Data are
 compared with those obtained during oil-firing.—S. K.

AUTHOR: BORODIN, V.P., DARMANYAN, P.E., YUDSON, I.A.,
and SHEVANDINE, L.S. PA - 2395

TITLE: The Experience of Conversion of Oil-Fired Open-Hearth Furnaces
to Natural Gas-Firing. (Opyt perevoda mazutnykh martenovskikh
pechey na otopleniye prirodnym gazom, Russian).

PERIODICAL: Stal', 1957, Vol 17, Nr 1, pp 124 - 129 (U.S.S.R.)
Received: 5 / 1957 Reviewed: 5 / 1957

ABSTRACT: In the course of 1956 - 1957 the furnaces of the "Krasnyy
Oktyabr'" steel mills will be converted from Mazout-firing to
natural gas-firing. At present the following furnaces in the USSR
work with natural gas: three open-hearth furnaces of 50 t each,
hot spots of an enamelling plant for disks, 15 thermal furnaces
in a calibrating plant, 8 in a sheet working mill, drying furnaces
in a electro-steel mill and one preheating furnace in a bolt
and rivet department. The gas is burned by means of injection
burners "Stal'proyekt" in the annealing furnaces and by means
of combined gas-mazout-burners in open hearth furnaces. The
characteristics of the open hearth furnaces and that of the gas
are given, and the feeding of the gas into the furnaces and
burners, flame regulation and control, the results obtained by
the furnaces in operation, as well as the optimum heat conditions
of the furnaces are described. In connection with the use of
oxygen for blowing also the methods for burning natural gas in

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